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PTO/SB/05 (4/98)
Approved for use through 09/30/2000. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	506.39084X00
First Inventor or Application Identifier	Kuniki KINO
Title	See 1 in Addendum
Express Mail Label No.	

JC803 U.S. PTO 09/665511 09/19/00

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: **Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231**

1. [X] * Fee Transmittal Form *(e.g., PTO/SB/17)* *(Submit an original and a duplicate for fee processing)*
2. [X] Specification [*Total Pages* 15] *(preferred arrangement set forth below)*
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to Microfiche Appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
3. [ ] Drawing(s) *(35 U.S.C. 113)* [*Total Sheets*]
4. Oath or Declaration [*Total Pages* 2]
   - a. [X] Newly executed (original or copy)
   - b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d)) *(for continuation/divisional with Box 16 completed)*
     - i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

NOTE FOR ITEMS 1 & 13 IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

5. [ ] Microfiche Computer Program *(Appendix)*
6. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   - a. [ ] Computer Readable Copy
   - b. [ ] Paper Copy (identical to computer copy)
   - c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [X] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [X] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
13. [ ] * Small Entity Statement(s) *(PTO/SB/09-12)* [ ] Statement filed in prior application Status still proper and desired
14. [X] Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
15. [ ] Other: .....

16. **If a CONTINUING APPLICATION,** *check appropriate box, and supply the requisite information below and in a preliminary amendment:*

[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No. _____/_____

Prior application information: *Examiner* _____ *Group / Art Unit:* _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

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Name (Print/Type)	William I. Solomon	*Registration No. (Attorney/Agent)*	28,565
Signature	William I. Solomon	*Date*	09/19/00

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Attachment to PTO/SB/05 (4/98) Utility Patent Application Transmittal

1. METHOD FOR PRODUCING AMINO ACIDS BY FERMENTATION

PTO/SB/17 (12/99)
Approved for use through 09/30/2000. OMB 0651-0032
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FEE TRANSMITTAL for FY 2000

Patent fees are subject to annual revision
Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT ($) 730.00

Complete if Known	
Application Number	
Filing Date	September 19, 2000
First Named Inventor	Kuniki KINO
Examiner Name	
Group / Art Unit	
Attorney Docket No.	506.39084X00

METHOD OF PAYMENT (check one)

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to.

Deposit Account Number: 01-2135`

Deposit Account Name: Antonelli,TerryStot&Kraus,LLP

☒ Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.17

2. ☒ **Payment Enclosed:** ☐ Check ☐ Money Order ☒ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	690	201	345	Utility filing fee	690.00
106	310	206	155	Design filing fee	
107	480	207	240	Plant filing fee	
108	690	208	345	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) 690.00

2. EXTRA CLAIM FEES

	Extra Claims		Fee from below	Fee Paid
Total Claims 10	-20** = 0	X	18	= 0
Independent Claims 3	- 3** = 0	X	78	= 0
Multiple Dependent				= 0

***or number previously paid, if greater; For Reissues, see below*

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	78	202	39	Independent claims in excess of 3
104	260	204	130	Multiple dependent claim, if not paid
109	78	209	39	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0.00

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	0.00
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	0.00
139	130	139	130	Non-English specification	0.00
147	2,520	147	2,520	For filing a request for reexamination	0.00
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	0.00
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	0.00
115	110	215	55	Extension for reply within first month	0.00
116	380	216	190	Extension for reply within second month	0.00
117	870	217	435	Extension for reply within third month	0.00
118	1,360	218	680	Extension for reply within fourth month	0.00
128	1,850	228	925	Extension for reply within fifth month	0.00
119	300	219	150	Notice of Appeal	0.00
120	300	220	150	Filing a brief in support of an appeal	0.00
121	260	221	130	Request for oral hearing	0.00
138	1,510	138	1,510	Petition to institute a public use proceeding	0.00
140	110	240	55	Petition to revive - unavoidable	0.00
141	1,210	241	605	Petition to revive - unintentional	0.00
142	1,210	242	605	Utility issue fee (or reissue)	0.00
143	430	243	215	Design issue fee	0.00
144	580	244	290	Plant issue fee	0.00
122	130	122	130	Petitions to the Commissioner	0.00
123	50	123	50	Petitions related to provisional applications	0.00
126	240	126	240	Submission of Information Disclosure Stmt	0.00
581	40	581	40	Recording each patent assignment per property (times number of properties)	40.00
146	690	246	345	Filing a submission after final rejection (37 CFR § 1.129(a))	0.00
149	690	249	345	For each additional invention to be examined (37 CFR § 1.129(b))	0.00
Other fee (specify) _____					0.00
Other fee (specify) _____					0.00

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 40.00

SUBMITTED BY				Complete (if applicable)	
Name (Print/Type)	William I.Solomon	Registration No. (Attorney/Agent)	28,565	Telephone	
Signature	William I. Solomon			Date	09/19/00

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METHOD FOR PRODUCING AMINO ACIDS BY FERMENTATION

BACKGROUND OF THE INVENTION

The present invention relates to a method for producing an amino acid by fermentation at high industrial efficiency.

As a direct fermentation method for producing and accumulating L-amino acids directly from saccahride, there have been known methods in which mutant strains derived from wild-type strains of microorganism belonging to the genus *Corynebacterium, Brevibacterium, Escherichia, Serratia* or *Arthrobacter*. For example, the following are known as L-amino acid-producing mutants: auxotrophic mutants which require amino acids, etc. (Japanese Published Examined Patent Application No. 10037/1981), mutants which have resistance to amino acid analogs and vitamins (Japanese Published Unexamined Patent Application Nos. 134993/1981 and 44193/1987), mutants which have both auxotrophic mutation and resistance mutation to amino acid analog (Japanese Published Unexamined Patent Application Nos. 31093/1975 and 134993/1981), mutants which have lowered degradability (Japanese Published Unexamined Patent Application No. 273487/1988, and Japanese Published Examined Patent Application No. 48195/1977), and mutants whose aminoacyl t-RNA-synthesizing enzymes have a decreased substrate affinity (Japanese Published Unexamined Patent Application No. 330275/1992).

It has also been known that the production of an amino acid can be improved by using a transformants obtained by transformation with recombinant DNAs carrying genes involved in the biosynthesis of amino acids (Japanese Published Unexamined Patent Application Nos. 893/1983, 12995/1985, 210994/1985, 30693/1985, 195695/1986, 271981/1986, 458/1990 and 42988/1990; Japanese Published Examined Patent Application Nos. 42676/1989, 11960/1993 and 26467/1993).

For producing L-tryptophan, there has been a report that the productivity of the amino acid was improved by giving resistance to aminoquinoline derivatives or to phenothiazine derivatives (Japanese Published Unexamined Patent Application No. 112795/1992).

SUMMARY OF THE INVENTION

An object of the present invention is to provide an industrially efficient method for producing an amino acid useful as medicament, chemical agent, food material and feed additive.

The present invention relates to the following aspects (1) to (10).

(1) A method for producing an amino acid, which comprises: (a) culturing in a medium a microorganism having an ability to produce an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine,

L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid and having resistance to an aminoquinoline derivative in a culture medium;

(b) producing and accumulating the amino acid in the culture; and

(c) recovering the amino acid from the culture.

(2) The method for producing an amino acid as described above in (1), wherein the aminoquinoline derivative is selected from the group consisting of chloroquine, amodiaquine, pentaquine, primaquine and the alkali metal salts of these substances.

(3) The method for producing an amino acid as described above in (1), wherein the amino acid is L-histidine.

(4) The method for producing an amino acid as described above in (1), wherein the microorganism is selected from the group consisting of genera *Serratia, Corynebacterium, Arthrobacter, Microbacterium, Bacillus* and *Escherichia*.

(5) The method for producing an amino acid as described above in (4), wherein the microorganism is *Escherichia coli* H-9341 (FERM BP-6674).

(6) A microorganism having an ability to produce an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-

tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid and having resistance to an aminoquinoline derivative.

(7) The microorganism described above in (6), wherein the aminoquinoline derivative is selected from the group consisting of chloroquine, amodiaquine, pentaquine, primaquine and the alkali metal salts of these substances.

(8) The microorganism described above in (6), wherein the amino acid is L-histidine.

(9) The microorganism described above in any one of (6) to (8), wherein the microorganism is selected from the group consisting of genera *Serratia, Corynebacterium, Arthrobacter, Microbacterium, Bacillus* and *Escherichia*.

(10) *Escherichia coli* H-9341 (FERM BP-6674).

DETAILED DESCRIPTION OF THE INVENTION

As the microorganism of the present invention, any microorganism can be used, so long as it has an ability to produce an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid(referred to as the amino acid, hereinbelow) and has resistance to an aminoquinoline derivative. Examples of the

microorganism includes microorganisms belonging to the genus *Serratia*, *Corynebacterium*, *Arthrobacter*, *Microbacterium*, *Bacillus* and *Escherichia*, such as *Serratia ficaria*, *Serratia fonticola*, *Serratia liquiefaciens*, *Serratia marcescens*, *Corynebacterium glutamicum*, *Corynebacterium mycetoides*, *Corynebacterium variabilis*, *Corynebacterium ammoniagenes*, *Arthrobacter crystallopoietes*, *Arthrobacter duodecadis*, *Arthrobacter ramosus*, *Arthrobacter sulfureus*, *Arthrobacter aurescens*, *Arthrobacter citreus*, *Arthrobacter globiformis*, *Microbacterium ammoniaphilum*, *Bacillus subtilis*, *Bacillus amyloliquefacines* and *Escherichia coli*.

As the aminoquinoline derivative for use in the present invention, any substance can be used, so long as it has the aminoquinoline skeleton. For example, 4-aminoquinoline derivatives such as chloroquine and amodiaquine and 8-aminoquinoline derivatives such as pentaquine and primaquine can be used as the aminoquinoline derivative. Additionally, the alkali metal salts of these substances can be used as the aminoquinoline derivative. All of these substances are known as antimalarial drugs. Herein, any alkali metal such as sodium and potassium can be used as the alkali metals.

The microorganism of the present invention can be obtained by subjecting a microorganism having an ability to produce an amino acid to a conventional mutation treatment including ultraviolet irradiation and treatment with mutagen

such as N-methyl-N'-nitro-N-nitrosoguanidine (NTG), culturing the resulting mutant strains under general conditions on an agar plate medium containing an aminoquinoline derivative at a concentration at which the parent strain cannot grow or grow poorly, and selecting colonies of the strain which grow more rapidly than that of the parent strain or colonies which are larger than that of the parent strain among the resulting colonies.

As the microorganism having an ability to produce the amino acid, a microorganism inherently having an ability to produce the amino acid can be used; alternatively, a microorganism which is newly obtained by subjecting a wild-type of a microorganism to produce the amino acid by known methods can also be used.

The known methods include cell fusion method, transduction method, and other gene recombinant techniques [for all, see *Molecular Cloning, A Laboratory Manual, Second Edition*, Cold Spring Harbor Laboratory Press (1989) (abbreviated as *Molecular Cloning, 2nd ed.* hereinbelow)], in addition to the above mutation treatment.

The microorganism of the present invention can also be obtained by preparing a mutant microorganism having resistance to an aminoquinoline derivative by an conventional mutation treatment, followed by subjecting the resulting microorganism to the above-mentioned method to confer on the microorganism

the ability to produce the amino acid.

Specific examples of the microorganisms of the present invention include *Escherichia coli* H-9341 (FERM BP-6674).

The production of the amino acid by using the microorganism of the present invention can be carried out by an conventional method for culturing bacteria.

As the medium used for the production of the amino acid, any of synthetic medium or natural medium may be used, so long as it appropriately contains a carbon source, a nitrogen source, an inorganic substance and trace amounts of nutrients which the strain requires.

As the carbon source, carbohydrates such as glucose, fructose, lactose, molasses, cellulose hydrolysates, crude saccharide hydrolysates and starch hydrolysates; organic acids such as pyruvic acid, acetic acid, fumaric acid, malic acid and lactic acid; and alcohols such as glycerin and ethanol can be used.

As the nitrogen source, ammonia; various inorganic salts such as ammonium chloride, ammonium sulfate, ammonium acetate and ammonium phosphate; ammonium salts of organic acids; amines; peptone, meat extract, corn steep liquor, casein hydrolysates, soybean cake hydrolysates, various fermented cells and digested matters thereof can be used.

As the inorganic substance, potassium dihydrogen phosphate, dipotassium hydrogen phosphate, magnesium phosphate,

magnesium sulfate, magnesium chloride, sodium chloride, ferrous sulfate, manganese sulfate, copper sulfate, calcium chloride and calcium carbonate can be used.

The microorganism is cultured under aerobic conditions such as shaking culture and aerated agitation culture, at a temperature within a range of 20 to 40°C, preferably within a range of 28 to 37°C. The pH of the medium is within a range of 5 to 9, preferably around neutrality. The pH of the medium is adjusted by using calcium carbonate, inorganic or organic acids, alkali solutions, ammonia and pH buffers. Generally, the amino acid is produced and accumulated in the medium, by culturing for 1 to 7 days.

After the completion of the culturing, the precipitates such as cells are removed from the medium, and the amino acid can be recovered from the medium by means of ion exchange treatment method, concentration method and salting-out method, etc., in combination.

Any amino acid can be produced, so long as it is the above-mentioned amino acid in the present invention. For example, L-histidine can be produced.

The present invention is further illustrated by the following Examples, which are not to be construed to limit the scope of the present invention.

Example 1:

Preparation of an L-histidine-producing mutant strain having resistance to an aminoquinoline derivative

The L-histidine-producing mutant strain H-9340 having resistance to 1,2,4-triazole alanine, which was derived from methionine-requiring *Escherichia coli* ATCC 21318 was subjected to a mutation treatment with N-methyl-N'-nitro-N-nitrosoguanidine (NTG) (0.2 mg/ml, 30°C, 30 minutes) according to a conventional method and spread on a 150 mg/liter primaquine disodium salt-containing agar plate culture medium [0.2 % glucose, 0.3 % potassium dihydrogen phosphate, 0.6 % disodium hydrogen phosphate, 0.01 % magnesium sulfate, 0.05 % sodium chloride, 0.1 % ammonium chloride, 50 mg/liter required nutrient (DL-methionine) and 1.5 % agar, pH 7.2].

The bacteria spread on the agar plate medium were cultured at 30°C for 2 to 6 days, and the growing large colonies were picked up and separated to obtain the strain H-9341. The strains H-9340 and H-9341 were deposited on March 9, 1999 with the National Institute of Bioscience and Human-Technology, Agency of Industrial Science and Technology, MITI (1-3, Higashi 1-chome, Tsukuba-shi, Ibaraki-ken, Japan), under Budapest Treaty with accession Nos. FERM BP-6673 and FERM BP-6674, respectively.

Example 2:

Comparative test of growth on agar plate culture medium

containing primaquine

The growth of the mutant strain H-9341 obtained in Example 1 was compared with the growth of the parent strain H-9340 on an agar plate medium containing primaquine.

Each of the mutant strains, which had been cultured in a natural medium for 24 hours and suspended in physiological saline, was spread at a cell density of 1 to 10 cells/cm^2 on an agar plate medium containing primaquine disodium salt at the same concentration as that at the time of the acquisition of each mutant strains, and cultured at 33°C for 4 days.

Growth or non-growth of the strains on the above media is shown in Table 1.

The parent strain H-9340 did not grow on (in) the agar plate culture medium containing primaquine.

Table 1

Bacterial strain	Additives for agar culture medium	
	No addition	Primaquine disodium salt
H-9340	+	-
H-9341	+	+

Example 3

Production of L-histidine

The production of L-histidine using the mutant strain H-9341 obtained in Example 1 and the parent strain H-9340 was carried out in the following manner.

Each of the strains H-9340 and H-9341 was inoculated in 6 ml of a seed medium (2 % glucose, 0.5 % molasses, 1 % corn steep liquor, 1.2 % ammonium sulfate, 0.3 % potassium dihydrogen phosphate, 0.015 % magnesium sulfate, 600 mg/liter DL-methionine, 100 mg/liter adenine, 3 % calcium carbonate, pH 6.2) in a large test tube, and cultured with shaking at 30°C for 12 hours.

Each of the obtained seed cultures (0.1ml) was inoculated in 5 ml of a production medium (6 % glucose, 1 % corn steep liquor, 2.4 % ammonium sulfate, 0.4 % potassium dihydrogen phosphate, 0.015 % magnesium sulfate, 10 mg/liter thiamine chloride salt, 10 mg/liter calcium pantothenate, 3 % calcium carbonate, pH 6.5) in a large test tube and was then cultured therein with shaking at 30°C for 48 hours.

After culturing, the amount of L-histidine accumulated in the medium was assayed by high-performance liquid chromatography.

The results are shown in Table 2.

Compared with the L-histidine productivity of the parent strain, the L-histidine productivity of the mutant strain H-9341 was improved.

Table 2

Bacterial strains	L-Histidine (g/l)
H-9340	13.0
H-9341	14.2

In accordance with the present invention, a microorganism having an ability to produce an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid and having resistance to an aminoquinoline derivative can be obtained and by culturing the microorganism in a medium, the productivity of the amino acid can be enhanced so that the amino acid can be industrially efficiently produced.

What is claimed is:

1. A method for producing an amino acid, which comprises:

(a) culturing a microorganism having an ability to produce an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid and having resistance to an aminoquinoline derivative in a medium;

(b) producing and accumulating the amino acid in the culture; and

(c) recovering the amino acid from the culture.

2. The method for producing an amino acid according to claim 1, wherein the aminoquinoline derivative is selected from the group consisting of chloroquine, amodiaquine, pentaquine, primaquine and the alkali metal salts of these substances.

3. The method for producing an amino acid according to claim 1, wherein the amino acid is L-histidine.

4. The method for producing an amino acid according to claim 1, wherein the microorganism is selected from the group consisting of genera *Serratia, Corynebacterium, Arthrobacter, Microbacterium, Bacillus* and *Escherichia*.

5. The method for producing an amino acid according to claim 4, wherein the microorganism is *Escherichia coli* H-9341 (FERM

BP-6674).

6. A microorganism having an ability to produce an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid and having resistance to an aminoquinoline derivative.

7. The microorganism according to claim 6, wherein the aminoquinoline derivative is selected from the group consisting of chloroquine, amodiaquine, pentaquine, primaquine and the alkali metal salts of these substances.

8. The microorganism according to claim 6, wherein the amino acid is L-histidine.

9. The microorganism according to any one of claims 6 to 8, wherein the microorganism is selected from the group consisting of genera *Serratia, Corynebacterium, Arthrobacter, Microbacterium, Bacillus* and *Escherichia*.

10. *Escherichia coli* H-9341 (FERM BP-6674).

ABSTRACT OF THE DISCLOSURE

The present invention provides a method for producing an amino acid selected from the group consisting of L-alanine, L-valine, L-leucine, L-isoleucine, L-methionine, L-phenylalanine, L-proline, glycine, L-serine, L-threonine, L-cysteine, L-tyrosine, L-asparagine, L-glutamine, L-lysine, L-histidine, L-arginine, L-aspartic acid and L-glutamic acid and useful as medicament, chemical agent, food material and feed additive at high industrial efficiency, the method comprising culturing a microorganism having an ability to produce the amino acid and having resistance to an aminoquinoline derivative in a medium, producing and accumulating the amino acid in the present invention in the culture, and recovering the amino acid from the culture.

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name, I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR PRODUCING AMINO ACIDS BY FERMENTATION

the specification of which (check one) [X] is attached hereto.

[ ] was filed on _____
as Application Serial No. _____
and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
265108/99 (Number)	JAPAN (Country)	20 September 1999 (Day/Month/Year Filed)	[X] Yes	[ ] No
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes	[ ] No
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes	[ ] No
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes	[ ] No
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes	[ ] No
(Number)	(Country)	(Day/Month/Year Filed)	[ ] Yes	[ ] No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status: patented, pending, abandoned)
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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